Aptitude tests for computer teletypesetting operators— an experiment

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If reliable tests for selecting operators to use these new machines could be devised, they would of course have all the advantages usually associated with objective tests. In addition, as many of the operators will be men who are already trained to operate a printing keyboard of one kind or another, it would be particularly helpful to them to know, as early as possible, whether they have the aptitude and the capacity to operate the new machines. If men should attempt to make the change and then find that they cannot operate at the level of efficiency required on the computer-style machines, they could be seriously distressed.

Selecting the tests

It was considered essential that the tests used should be easy to administer and that the equipment be relatively inexpensive. This would make it possible for printing works all over the country to use the tests readily with only a modicum of training for the administrator.

An analysis of the mechanical aptitudes for operating the computer keyboards resulted in the decision to test for: eye and hand co-ordination; finger dexterity; and level of concentration.

The advisability of testing for intelligence was considered and rejected. The specific level or aspect of intelligence required for keyboard operating has not yet been determined. The ability to read and an ability to follow instructions could not easily be abstracted from the intelligence tests available.

Devising the tests

Aptitude tests are most successful where they are seen to be related to the job for which they purport to test. It is said that there is a higher level of motivation to do the tests as well as possible where this relation is readily seen. For this reason many of the more commonly used tests were ruled out, (eg, pin board tests of various kinds used for testing finger dexterity would have had no obvious relevance to striking keys on a keyboard).

After many long discussions and patient research we decided on a finger dexterity test on a typewriter-style keyboard.

For eye and hand co-ordination, the Kieler Determinationsgerät seemed to hold out most hope. There were, however, serious difficulties in using it. It is only obtainable from Germany and there was a fifteen month delay in delivery. It is too expensive to have a large number in use, and the problems of having all subjects to be tested come to one central testing office ruled it out altogether. A device designed by The Department of Industrial Psychology at the University of Stellenbosch, South Africa, rather like a two-handed lathe operation, seemed to have possibilities. Then S. H. J. Freemantle of the Kingston College of Technology most helpfully designed a device like that of the Stellenbosch University. There remained the problem of mobility.

How to have enough of these machines available so that groups of people could be tested and how to transport them easily? Dr T. Margerison, who should be credited with initiating this experiment, suggested using the 'Etch-a-Sketch' (which closely duplicates the motions of the two-handed lathe test). Again a simple solution, this time a child's toy.

There remained the problem of testing for level of concentration. It was recognised that operating computer-style typesetters requires a level of concentration which is different from that required for operating more conventional machines. Most tests for concentration are personality-type tests, and these we wished to avoid. The requirement for concentration exists in the level of consciousness which enables the operator to continue to read and produce copy while almost simultaneously feeding instructions into the computer. Following on the principle that tests should be seen to be related to the job to be done, ideas began to locate in the reading of the copy. The ability to read ahead when keyboarding characterises all fast keyboard operators. Reading methods and speed would therefore influence keyboarding speeds. A reading test might be the answer to the search for a test for concentration. We had already used the International Tutor Machines' Quicker Reading Machine to improve the reading speed of operators on typewriter-style keyboards, and this company was kind enough to allow us to use their standardised tests. To determine whether these three tests had any validity for selecting keyboard operators, it was decided to test them on typists and measure the results against known typewriting speeds. There is a volume of evidence to prove that speed and accuracy in performance will be greatly affected by methods of training. Operators of machines in many different industries who have been unable to increase their rate of production beyond a certain level, even after many years of experience, have been able to do so after re-training. The increase in many cases has been in the nature of 100 per cent. Usually this has followed a re-training programme based on the analytical method of training. This is one of the complicating factors in this situation. Just how complicating the training factor really is, is not yet clear.